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Mr. Agassiz made a communication intended to show: —

That the principle generally received by geologists, that difference of fossils indicates difference of age, and that identity of fossils is essential to synchronism of deposits, is erroneous; for different areas of the same geological epoch would exist under different external conditions, and would therefore contain very different fossils, — just as the faunæ of the present day differ widely from each other in different parts of the earth; also that the so-called tertiary age is made up of at least ten distinct ages, with faunæ specifically distinct from each other. If the principle thus far advocated has led to correct results, it is chiefly because the researches upon this subject have been carried on within one and the same zone in Europe and America. With the extension of our comparisons over wider areas of the earth's surface, it becomes evident that the faunæ of past ages, even when contemporary, may differ, according to their geographical relations, in a way similar to the differences existing among the faunæ of the present period.

Five hundred and fourteenth meeting.

November 12, 1862. — STATUTE MEETING.

The PRESIDENT in the chair.

The Recording Secretary read letters received since the previous meeting.

Cyrus M. Warren, of Boston, was elected a Fellow, in Class I., Section 3;

Alexander E. R. Agassiz, of Cambridge, in Class II., Section 3;

William P. G. Bartlett, of Cambridge, in Class I., Section 1;

George Searle, of Brookline, in Class I., Section 1.

Dr. C. T. Jackson presented a paper on the extraction of the cobalt oxide from the iron pyrites of Brockville, Canada West, by Thomas Macfarlane. He also enforced the great importance of a careful examination of the pyrites of this country for nickel, on account of the value of this metal at the present time as an element in the currency.

Dr. B. A. Gould presented some copies of his paper recently published by the Coast Survey, and entitled, "*Standard Mean*

Right-Ascensions of Circumpolar and Time Stars, prepared for the use of the U. S. Coast Survey." He stated that

This pamphlet contains, — 1st, the right-ascensions and declinations, for the Mean Equinox of 1855.0, of 48 Circumpolar Stars, or stars within 25° of North Polar Distance, together with their proper motions and the coefficients of all those terms of the precession which became appreciable within one hundred years; 2dly, the right-ascensions, proper motions, annual precessions, and secular variations of 128 time-stars, or stars favorably situated for determining time within the latitude of any portion of the United States; 3dly, the corresponding mean right-ascensions of each of these 176 stars for the beginning of every year, from 1851 to 1863 inclusive. To the fundamental tables are also appended the logarithmic constants for reducing from the mean to the apparent equinox, and their annual variations. The positions of these stars were originally computed in 1854, but have repeatedly since that time been revised and corrected by the introduction of new observations; and they seem to be the best yet attainable, inasmuch as all observations of a high character which were to be found on record have entered into the determination. For each catalogue or series of observations employed, the reduction to the zero of Argelander's Åbo catalogue has been carefully deduced by the method of least squares, having regard both to constant terms and to terms which are functions of the right-ascension or declination; the materials being derived, 1st, from collation of all stars common to Argelander's catalogue and to the authority under investigation; and 2dly, where this means was sufficient, by indirect comparison through the medium of other catalogues.

The star-lists in their present form were essentially completed early in 1861, although a few observations have since then been incorporated with the other materials. In March, 1862, manuscript copies were furnished by Professor Bache to the Superintendents of the Washington Observatory and of the American Nautical Almanac, on their respective applications, and these places adopted for use by them; so that the fundamental places or zeroes employed for determining time and right-ascensions are now identical in all the national scientific institutions.

The equinox of 1855.0 was originally selected, because this date, being the semi-decade nearest to the time of computation, was then the most convenient. By a happy coincidence, this epoch is precisely a century later than the epoch of Bradley's observations, as reduced by

Bessel in the *Fundamenta Astronomiæ*, the earliest trusty telescopic determinations; and this circumstance has seemed a sufficient reason for leaving the original epoch of computation unchanged, although a date nearer to the present time of publication would of course appear to be more natural. The small pamphlet now submitted contains only the last results of the laborious and protracted investigation which has long been prepared for the "Records and Results of the U. S. Coast Survey," of which it constitutes one volume. This work has been long delayed, in spite of the efforts of the Superintendent, and the present war threatens to postpone the publication for an indefinite period. It has now seemed desirable to the Superintendent of the Survey for many reasons to circulate in type the results long since disseminated in manuscript. Dr. Gould added, that, while the places here given were, in his belief, the best yet attainable, — nevertheless, since each new measurement furnished new materials for the research, he proposed to continue the work hitherto accomplished, by the periodic incorporation with the old data of the results of recent observation, that the limits of possible error may be reduced to a minimum, and that astronomers may hereafter find ready access at all times to the best positions for fundamental stars which the condition of practical astronomy affords.

The committee to whom was recommitted the proposed draught of amendments to the Statutes and Standing Votes reported them back to the Academy for enactment, recommending, however, the adoption of the amendment of the draught of the Statute, Chapter IV., Section 2, essentially as proposed at the former session.

The propositions being severally put to vote, the following were duly enacted as Statutes: —

Chapter III., Section 3. *The President, or in his absence the next officer as above enumerated, shall nominate members to serve on all the Committees of the Academy which are not chosen by ballot.*

Chapter IV., Section 1. *At the Annual Meeting there shall be chosen the following Standing Committees, to serve for the year ensuing, viz.:*

2. *The Committee of Finance, to consist of the President, Treasurer, and one Fellow chosen by ballot; who shall have charge of the investment and management of the funds and trusts of the Academy. The general appropriations for the expenditures of the Academy shall be moved by this Committee at the Annual Meeting, and all special appropriations*

from the general and publication funds shall be referred to or proposed by this Committee.

3. *The Rumford Committee, of seven Fellows, to be chosen by ballot; who shall consider and report on all applications and claims for the Rumford Premium; also on all appropriations from the income of the Rumford Fund, and generally see to the due and proper execution of this trust.*

Chapter VI., Section 4. *All moneys which there shall not be present occasion to expend shall be invested by the Treasurer, under the direction of the Finance Committe, on such securities as the Academy shall direct.*

Chapter VII., Additional Section: —

1ª. *To all books in the library procured from the income of the Rumford Fund, the Librarian shall cause a stamp or label to be affixed, expressing the fact that they were so procured.*

The following additional Standing Vote was enacted: —

2ª. *Books, publications, or apparatus shall be procured from the income of the Rumford Fund only on the certificate of the Rumford Committee, that they, in their opinion, will best facilitate and encourage the making of discoveries and improvements which may merit the Rumford Premium.*

Also voted, That the Statutes and Standing Votes as now amended be printed under the direction of the Committee on Publication.

Five hundred and fifteenth Meeting.

December 10, 1862. — MONTHLY MEETING.

The PRESIDENT in the chair.

The Corresponding Secretary read letters from Messrs. Bartlett, Searle, and A. Agassiz, in acknowledgment of their election as Fellows.

Dr. Hill read a paper "On a Geometrical Illustration of several Algebraical Theorems concerning the Roots and Powers of Monomials."

Professor Peirce showed that some modifications of the geometrical figure would render it capable of illustrating a still wider range of algebraical theorems.